
Research Project Title: Use of Recycled Concrete Aggregate in New Concrete Mixes

Purpose of the Project

The purpose of the project is to qualify recycled concrete aggregates from various sources throughout the state of Tennessee by measuring their physical, chemical, and mechanical properties and to determine how these properties influence the performance of new concrete mixes. The ultimate goal of this project is to develop guidelines that would aide TDOT engineers in selecting adequate RCAs for the new paving concrete. Specifically, this project is to develop methods and procedures for optimizing the gradation of RCAs as well as designing and proportioning concrete mixes that incorporate different types and levels of RCAs.

Scope and Significance

The scope of the research project includes:

- Testing the properties of recycled concrete aggregates from various sources in Tennessee and the performance of new concrete mixes using different types, levels, and gradations of recycled concrete aggregates.
- Developing guidelines for classifying recycled concrete aggregates and for using recycled concrete aggregates in new concrete mixes for TDOT.

Expected Outcomes

The following are expected outcomes of this research project:

- Benefit to TDOT: Adopting recycled concrete aggregates into TDOT new concrete mixes will save the natural resources and the landfill space in Tennessee. The continued recycling and unlimited reusing of concrete as aggregates in new concrete mixes enable Tennessee transportation structures to be built and maintained more sustainably. In addition, this new practice will avoid dual efforts of hauling away old concrete and transporting the natural virgin aggregate to the site, thus saving fuels and costs.
- Implementing the results of this study will help TDOT engineers to develop specifications on the use of recycled concrete aggregates in TDOT new concrete mixes.

Time Period

The time period for the project is two years, starting from August 1st, 2019 and expecting to finish by July 31, 2021.

Contact Information

Principal Investigator (PI): Zhifu Yang Concrete and Construction Management Middle Tennessee State University 3101 East Main Street, Murfreesboro, TN37132 615-494-7609 Zhifu.Yang@mtsu.edu	TDOT Lead Staff: Derek Gaw Division of Materials and Tests 615-350-4106 Derek.Gaw@tn.gov
--	---